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The period is very nearly 11·6 years.

Mr. Burnham gives the magnitudes 4·3 and 5·0. As regards the distant Struve companion, the measures show rectilinear motion in the direction 72° of $0^{\prime\prime}{\cdot}039$ per annum; and if this is regarded as the proper motion of *κ Pegasi*, we have for this star a P.M. in

$$\text{R.A. of} \quad +0^{s}{\cdot}0025$$

and in

$$\text{N.P.D. of} \ -0^{\prime\prime}{\cdot}012$$

The measures are for Σ 2824—

$$1894{\cdot}83 \qquad 298^{\circ}{\cdot}8 \text{ and } 12^{\prime\prime}{\cdot}23.$$

The P.M. used for *κ Pegasi* is R.A. ·000 and N.P.D. $-0^{\prime\prime}{\cdot}010$ (Auwers). Bradley did not observe it in R.A.; but the Piazzi place gives P.M. in R.A. of $+0^{s}{\cdot}0021$.

Royal Observatory, Greenwich:
1894 *November* 2.

Since the above note was written I have found in *Popular Astronomy*, 1894 April, a discussion of this pair by Mr. Burnham, using his later measures, and another by Mr. Barnard, made with the 36-inch Lick refractor. His ellipse practically agrees with the one here given. The period he makes 11·37 years.

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On the Orbit of η Cassiopeiæ (Σ 60).

By T. Lewis.

For various reasons this binary star is very interesting, and a better knowledge of its orbit seemed desirable. The following elements and notes are submitted in the hope that double-star observers will give it some attention.

The components are yellow and purple, and of the 4th and 7·6 mag. respectively.

The unusually large proper motion is in

$$\text{R.A.} \ +0^{s}{\cdot}1346 \text{ and in N.P.D.} \ +0^{\prime\prime}{\cdot}481.$$

Its parallax has been determined by

Otto Struve	$+0^{\prime\prime}{\cdot}096$	from	measures of	distance
,, ,,	$+0{\cdot}373$	,,	,,	position
Schweizer	$+0{\cdot}202$	,,	,,	distance
,,	$+0{\cdot}139$	,,	,,	position

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A redetermination of parallax ought to be made.

The mean angular distance of the components is large ($8''\cdot4$), and is only excelled by *Sirius* and *α Centauri.*

The orbits computed are

Computer.	Date.	P (years).	τ	e	Ω	γ	λ	a
					° ′	° ′	° ′	″
Powell	1861	181	1896·0	0·771	25 33	57 59	243 39	10·34
Dunér	1876	176·4	1924·8	·627	50 48	68 30	245 54	10·68
Doberck	1876	222·4	1909·2	·576	39 57	53 50	223 20	9·83
Grüber	1877	195·2	1901·3	·624	33 20	48 18	229 27	8·64
Coit	1882	167·4	1904·0	·622	41 2	52 5	233 6	8·70
Lewis	1894	208·1	1908·9	·500	47 6	47 36	214 10	8·45

It has, therefore, described over one-half its orbit while under observation, and there can be little doubt that the earlier computed dimensions of the orbit are too large.

Assuming the present elements, and adopting $0''\cdot202$ (the arithmetical mean) as the parallax, we find that the mean distance between the components is 41·84 times that between the Sun and the Earth, or 3,990,000,000 miles. *Neptune* is 30 times, or 2,700,000,000 miles.

Further, the combined mass is 3·54 that of the Sun, and the distance of the system from us is one million times the semi-diameter of the Earth's orbit.

Spectroscopic observations for motion in the line of sight would give further knowledge of this system.

I have compared the computed and mean observed places for each year, and although there are evidences of systematic error, there is a very fair agreement. As Mr. Coit published in *Monthly Notices*, 1882 May, a very complete set of observations, I think the following sufficient:—

Date.	Observed		Calculated	
	Angle.	Distance.	Angle.	Distance.
	°	″	°	″
1780·5	...	11·50	58·9	11·82
1782·5	60·1	...	60·2	11·87
1803·1	70·7	...	70·7	11·55
1819·8	80·2	10·80	79·9	10·63
1830·8	87·0	9·84	87·8	9·80
1840·4	96·2	8·95	95·8	8·93
1850·6	105·7	8·10	106·0	7·88
1860·6	116·8	7·02	119·4	6·90
1870·4	134·8	6·20	136·3	5·80
1880·3	160·2	5·30	159·6	5·31
1890·8	188·4	5·07	188·7	4·96
1894·1*	200·2	4·96	198·7	4·92

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* I am indebted to Mr. Maw for this observation.

And an ephemeris for the next few years:—

	°	″		°	″
1895·5	203·3	4·85	1898·5	212·3	4·75
1896·5	206·3	4·82	1899·5	215·4	4·70
1897·5	209·3	4·79	1900·5	218·4	4·64

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A Comparison between the Results of the Radcliffe Catalogue of Stars, 1890, *and the Greenwich Results*, 1887–91, *contained in the Greenwich Five-Year Catalogue*, 1890. By E. J. Stone, M.A., F.R.S., Radcliffe Observer.

The Radcliffe Catalogue of 6,424 stars for the epoch 1890, which has just been distributed, and the Cape Catalogue for 1880, will afford positions of all the stars in the southern hemisphere of not less than the 7th magnitude, except those in clusters, and of fainter stars in those portions of the sky where there are no stars so bright as the 7th magnitude.

The Radcliffe Catalogue has been purposely made to overlap to a considerable extent the work of the Cape Catalogue in order to afford materials for a comparison of the results. A complete comparison of the positions of all the stars contained in these catalogues is nearly completed; the results show that the agreement both in right ascension and north polar distance between the Radcliffe Catalogue and the Cape Catalogue, 1880, is a very close one.

The comparison has also been extended to the stars common to the Radcliffe Catalogue and the Greenwich Catalogue for 1880. These comparisons show that the north polar distance results of the Cape Catalogue fall between those of the two northern observatories, and that the differences are not large for either observatory. But the differences between the Radcliffe and Greenwich results are systematic, and are common to both the Greenwich Catalogue for 1880 and to the small catalogue of 258 fundamental stars, 1890 which has just been issued. I have given, therefore, in the present paper a table which shows the differences between the Radcliffe results and the Greenwich results for 1890 for the small catalogue of fundamental stars.

I need hardly say that all the corrections which I know to be necessary to clear the Radcliffe observations from systematic errors have been applied; but, of course, I do not expect that systematic errors have been entirely avoided. The differences between the direct and reflexion results found at Oxford have been too small, as may be seen on reference to the annual volumes for 1880–87, to render any corrections in this direction necessary; and the Radcliffe results are independent of *any*

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